CLAIMS

What is claimed is:

1   1.   A method, in a data processing system, of managing incoming calls for an organization

2   having a plurality of departments, an organization database and a plurality of agents, the method

3   comprising the steps of:

4   receiving one or more incoming calls by a call manager object;

5   creating an associated call object for each incoming call in response to receiving the

6   incoming call;

7   playing to the caller a voice menu describing a plurality of selection items in a

8   department table corresponding to a department in the organization, each call object including

9   the department table with which the call is currently associated;

10   receiving one or more input signals from the caller in response to the voice menu played

11   to the caller; and

12   managing the incoming call according to a call-management policy based on the

13   information contained in the table and the input signals from the caller to attempt to reach one of

14   the plurality of agents of the organization.

1   2.   A method of managing incoming calls as recited in claim 1, wherein the step of receiving

2   an incoming call includes the steps of:

3   listening for an incoming call; and

4   connecting to the incoming call when it occurs.

1   3.   A method of managing incoming calls as recited in claim 1, wherein the step of receiving

2   one or more input signals from the caller includes the steps of:

3   receiving a selection event from the caller; and

4   determining from the selection event which of the selection items in the department table

5   was selected by the caller.

1   4.   A method of managing incoming calls as recited in claim 3, wherein the selection event

2   is a DTMF tone produced by the caller.

1 5.   A method of managing incoming calls as recited in claim 3, wherein the selection event

2 is a recognized voice input from the caller.

1 6.   A method of managing incoming calls as recited in claim 1,

2   wherein the table includes alternate routing information;

3   wherein the step of managing the incoming call according to a call-management policy

4 includes the steps of:

5   determining if an agent is available according to the department table described in the

6 voice menu;

7   if the agent is available,

8   obtaining the agent's directory number from the table, transferring the call to the agent,

9 and disconnecting from the call; and

10   if the agent is not available,

11   handling the call according to alternate routing information.

1 7.   A method of managing incoming calls as recited in claim 6,

2   wherein the alternate routing information includes voice mail box information and

3 operator information;

4   wherein the step of handling the call according to the information in the table includes

5 the steps of:

6   determining whether or not voice mail box is available for the department according to

7 the table;

8   if voice mail is available,

9   recording a message from the caller and storing it in the voice mail box;

10   if voice mail is not available,

11   determining whether the operator is available;

12   if the operator is available,

13   transferring the caller to the operator; and

14   if the operator is not available,

15   recording a message from the caller in the default mailbox disconnecting from the caller.

8.   A method of managing incoming calls as recited in claim 1, wherein the plurality of agents includes local agents and one or more remote agents, each of which can have access to the organization database.

1   9.   A method of managing incoming calls as recited in claim 8, wherein a remote agent is

2   connected to the organization through an ISDN line.

1   10.   A method of managing incoming calls as recited in claim 9, wherein remote agents

2   communicate information to the organization over the D-channel of the ISDN using X.25

3   protocol.

1   11.   A method of managing incoming calls as recited in claim 10, wherein the information

2   communicated includes agent status and queries not visible to the caller.

1   12.   A method of managing incoming calls as recited in claim 8, wherein remote agents can

2   communicate to each other and to local agents over the Internet.

1   13.   A method of managing incoming calls as recited in claim 1,

2   wherein the incoming call has caller ID information associated with it; and

3   wherein the step of managing the incoming call according to the call-management policy

4   includes:

5   transferring the incoming call to an agent based on the caller ID information; and

6   disconnecting from the call.

1   14.   A method of managing incoming calls as recited in claim 1, wherein the department table

2   can contain Java objects.

1   15.   A method of managing incoming calls as recited in claim 14, wherein a Java object in the

2   table is a voice menu file.

1   16.   A method of managing incoming calls as recited in claim 14, wherein a Java object in the

2   table is an XML object.

1   17.   A method of managing incoming calls as recited in claim 14, wherein a Java object in the

2   table is a file object.

1   18.   A method of managing incoming calls as recited in claim 14, wherein a Java object in the

2   table is another table object.

1   19.   A method of managing incoming calls as recited in claim 1, wherein the department

2   tables are JDBC-accessible tables.

1   20.   A method of managing incoming calls as recited in claim 1,

       wherein the department table has a plurality of rows and columns; and

       wherein a row in the department table is selected by the input signals from the caller; and

4   wherein the columns of the selected row contain information used by the call manager to

5   implement the call-management policy.

1   21.   A method of managing incoming calls as recited in claim 20, wherein the columns of the

2   selected row include fields for specifying:

3   a voice menu file for selected row,

4   the availability of an agent,

5   the agent's directory number,

6   the availability of another department and

7   the availability of voice mail for the department for the call-management policy.

22.   A method of managing incoming calls as recited in claim 1, wherein each call object is
       an element of an array of call objects managed by the call manager.

1   23.   A method of managing incoming calls as recited in claim 1, wherein the call manager can

2   invoke any one of the call objects to play a voice menu, record a caller message, to transfer a

3   call, or to obtain another department table for the call associated with the call object.

1   24.   A method of managing incoming calls as recited in claim 1, wherein the call object is

2   capable of being coupled to an ISDN PSTN system and capable receiving notice of and

3   responding directly to ISDN events upon their occurrence.

1   25.   A method of managing incoming calls as recited in claim 1, wherein the call manager is

2   capable of being coupled to an ISDN PSTN system and capable of receiving notice of and

3   responding directly to ISDN events upon their occurrence.

26.   A method, in a data processing system, of managing incoming calls for an organization

having a plurality of departments, an organization database and a plurality of agents, the method

comprising the steps of:

    (a) receiving an incoming voice call by a call manager object;

5   (b) creating an associated call object for each incoming call in response to receiving the

6   incoming call;

7   (c) playing to the caller a voice menu corresponding to a plurality of selection items in a

8   department table for the organization, each call object including the department table with which

9   the call is currently associated;

10   (d) receiving an input signal from the caller in response to the voice menu played to the

11   caller, the input signal specifying one of the plurality of selection items in the department table;

12   (e) determining whether or not an agent is available for the selected item in the

13   department table;

14   if an agent is available,

15   (f) obtaining the agent's number from the department table and transferring the call to the

16   agent and continuing at step (h);

17   if an agent is not available and if another department table is available,

18   (g) obtaining another department table from the organization database and continuing at

19   step (c); and

20   (h) disconnecting from the caller.

1   27.   A method of managing incoming calls for an organization having a plurality of

2   departments, an organization database and a plurality of agents as recited in claim 26, further

3   comprising the steps of:

4   subsequent to step (h),

5   if another department table is not available,

6   (j) determining from the table whether department voice mail is available;

7   if department voice mail is available,

8   (k) recording a voice message from the caller;

9   if department voice mail is not available,

10   (l) determining whether an operator is available;

11   if the operator is available,

12   (m) transferring the call to the operator; and

13   if the operator is not available,

14   (n) recording a voice message from the caller.

1   28. A computer system configured to be a call-center for an organization having a plurality

2   of departments, an organization database and a plurality of agents, comprising:

3   a computer system including a main processor;

4   an ISDN interface adapter connected to multiple ISDN B-channels and the main

5   processor;

6   a main memory connected to the main processor, the main memory storing a computer

7   program instructing the main processor to carry out the steps of:

8   receiving an incoming call from a caller by a call manager object;

9   creating an associated call object for each incoming call in response to receiving the

10   incoming call;

11   playing a voice menu corresponding to a plurality of selection items in a department

12   table for the organization to the caller over an ISDN B-channel, each call object including the

13   department table with which the call is currently associated;

14   detecting incoming signals from the caller on an ISDN-B channel in response to a voice

15   message played for the caller;

16   accessing the table based on the incoming signals from the caller; and

17   connecting the caller to any available agent according to a call-management policy based

18   on the table.

29.   A computer processing storage medium have stored thereon a program for managing incoming calls for an organization having a plurality of departments, an organization database and a plurality of agents, the program instructing the computer processing system to carry out the steps of:

receiving one or more incoming calls;

creating an associated call object for each incoming call in response to receiving the incoming call;

playing to the caller a voice menu describing a plurality of selection items in a department table corresponding to a department in the organization, each call object including the department table with which the call is currently associated;

receiving one or more input signals from the caller in response to the voice menu played to the caller; and

managing the incoming call according to a call-management policy based on the information contained in the table and the input signals from the caller to attempt to reach one of the plurality of agents of the organization,

30.   A computer processing storage medium have stored thereon a program for managing incoming calls for an organization having a plurality of departments, an organization database and a plurality of agents as recited in claim 29,

wherein the table includes agent availability information and alternative routing information.

31.   A call management software system for managing incoming calls to an organization having a plurality of departments and a plurality of agents, the system comprising:

a call object associated with each incoming call, the call object including a plurality of call object methods and a table associated with a department, the table containing information to guide the management of the incoming call; and

a call manager object including a plurality of call manager object methods, the call manager object for creating a call object for each incoming call, for embedding the table into the call object and for invoking methods of the call object based on the information in the table to attempt to transfer the call to an agent of the organization.

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1   32.   A call management software system for managing incoming calls to an organization

2   having a plurality of departments and a plurality of agents as recited in claim 31, further

3   including a Java-ISDN interface program for implementing one or more of the call object

4   methods in native code and for providing an interface which allows the call manager and call

5   objects to respond to hardware events pertaining to the incoming call.

1   33.   A call management software system for managing incoming calls to an organization

2   having a plurality of departments and a plurality of agents as recited in claim 31, wherein the

3   table is a JDBC-accessible table.

1   34.   A call management software system for managing incoming calls to an organization

2   having a plurality of departments and a plurality of agents as recited in claim 31, wherein the

3   table contains Java objects.